In another embodiment, there is a combination of the ball joint described just above, and a socket to provide a ball joint system. The socket comprises a cylindrical housing having a wall with an internal surface wherein the internal surface is threaded to receive the housing in it and the socket has a means of attachment for attachment near a terminal end of a carrier for the ball joint system.

Finally, there is an additional embodiment of this invention that is an automotive suspension system incorporating the ball joint systems described just above.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a full view of a ball joint system of this invention that is fully assembled.

Figure 2 is a full view of the ball and the elongated shaft of this invention.

Figure 3 is a full view of the housing of this invention

Figure 4 is a full top view of the housing of this invention without the retaining member in place

Figure 5 is a full top view of the housing of this invention with the retaining member in place.

Figure 6 is a full cross-sectional view of the housing of Figure ~~3~~ 4 through the lines ~~100-100~~ 6-6 of Figure ~~3~~ 4 ~~and also showing the ball therein~~.

Figure 7 is a full view of the retaining member of this invention.

Figure 8 is a full cross-sectional view of the retaining member of Figure 7 through the lines ~~200-200~~ 8-8 of Figure 7.

Figure 9 is a full view of a fully assembled ball joint system of this invention and including the socket.

Figure 10 is a full top view of the socket of Figure 9.

Figure 11 is a schematic drawing of one type of automotive suspension system showing the use of the ball joint systems of this invention.

Figure 12 is a full view in perspective of a portion of the suspension system of Figure 11, wherein there is shown a wishbone support arm containing a ball joint system of this invention.

Figure 13 is a full top view of the wishbone support arm of Figure 12.

With reference to Figure 4, which is a top view of the housing 4, there is shown the flange 10, the fastening means opening 9, in phantom, the internal threads 17 for accommodating the external threads 18 of the retaining member 6, and the seat 18 for the ball 3, which is located near the bottom edge 15 of the housing 4.

Further, with reference to Figure 5, which is a top view of the housing 4, wherein there is shown the flange 10, therein is situated in the housing 4, a retaining member 6, wherein there is shown the top 19 of the retaining member 6, a concavity 20 in the top 19, and detachedly fixed in the concavity 20, a grease zerk fitting 21. Generally, such grease zerk fittings 21 are threaded and screwed into a threaded opening and that is contemplated within the scope of this invention as well as any convenient means of inserting and fastening the grease zerk fitting 21. Also shown in this Figure are indentions 22, which are indented in the wall of the concavity 20, which indentions 22 are useful for applying a wrench or some other viable means to turn the retaining member 6 in and out of the housing 4. The indentions 22 are not critical to this invention and can be optionally included in the retaining member 6, and can be configured other than as an indention as shown.

Reference should also be made to Figure 6, which is a cross-sectional view of the housing 4, taken through line ~~100-100~~ 6-6 of Figure ~~3~~ 4, wherein there is shown the flange 10, the opening 9, the set screw 8 tail end, the external threads 5, and the internal threads 17, which accommodate the external threads 24 of the retaining member 6 (see also Figures 7 and 8).

With further reference to the retaining member 6, reference should be made to Figure 7, which is a full view of the retaining member 6, showing the top 19 and the external threads 24. Figure 8 is a full cross-sectional view of the retaining member 6 through line ~~200-200~~ 8-8 of Figure 7, wherein, there is shown the top 19, the external threads 24, the concavity 20, and the grease fitting 21. Also shown is the duct 23, which carries lubricant applied to the grease fitting 21 to be carried to the void 25 (see Figure 8), wherein the ball 3 is shown and wherein the majority of the lubricant resides. Also shown in Figure 6 are the shallow channels 26 which in the prior art ball joints are typically placed into the ball 2, but which in this invention are placed in the interior of the socket 16. The reason for this placement of the shallow channels 26 is primarily cost, as